should be acceptable without specific provision to prevent this.

There are men willing, and anxious and eager to exploit the profession and the public and they have done it, and they will do it again if they are permitted.

In conclusion let me urge you to pay greater attention to the literature which will be placed before you from time to time, to view this subject with an open mind. Be ready to give and take a little to secure uniformity of opinion. Be ready to respond promptly to calls for information and action.

THE OPERATIVE TREATMENT OF VERTEBRAL TUBERCULOSIS.*

By ELLIS JONES, M. D., Los Angeles.

This paper is based upon an experience gained from thirty-two cases of bone transplantation for tuberculous spondylitis extending over a period of three years. Dr. Albee has operated three cases in my Los Angeles clinic which have been under my care and I am including them in this paper. Realizing that enough time has not elapsed to be able to draw trustworthy conclusions as to their ultimate results, cases operated during the past six months are omitted.

Albee's technic has been rigidly adhered to in every case, except one, where the transplant was grafted laterally into the bases of the spinous processes. In all other cases a tibial graft has been transplanted into the split spinous processes of the diseased vertebræ. In the lumbar region, the transplant has included one vertebra above and below the lesion. In the dorsal region, the transplant has included two vertebræ above and below. In all cases the transplant has consisted of periosteum, cortical bone, endosteum, and marrow substance. The wisdom of including these structures in all grafts is obvious, as has been demonstrated by McWilliams, Phemister, Albee and others.

A motor saw, we have found, saves time, avoids unnecessary traumatism, eliminates shock, and favors precision in fitting and shaping the graft to the size and curve of the kyphosis. The use of hand instruments, the mallet and chisel, in removing the graft and shaping and molding it, is crude and except in cases of extremely moderate kyphosis,—inexact. That some surgeons persist in the use of manual instruments for the removal of the transplants, owing to a personal pride in a real or fancied ability to do so deftly, is deplorable. We can not conceive of any surgeon successfully attacking a kyphosis of any considerable size except with the use of a motor outfit.

To Dr. Albee, we are indebted for the new treatment of spondylitis. Such treatment we believe is indicated at all ages, where pain and muscular spasm demonstrate destruction and crushing of the vertebral bodies. The earlier the operation is done, the better the prognosis. It is especially indicated in the presence of psoas abscess, paraplegia, and increasing deformity. Wherever fixation of the spine is permanently indicated, the use of the transplant, or in other words, internal fixation, is definitely called for.

The Albee operation *is not a panacea* for tuberculous spondylitis. It is simply the most efficient method of splinting the diseased vertebrae that has ever been devised. Orthopedic surgeons have long realized the impossibility of obtaining actual immobilization of diseased vertebrae by any external means. Spinal braces, plaster jackets and recumbency, secure partial fixation only. One great advantage of Albee's method is that it accomplishes fixation in less than a year's time, which is in marked contrast to the five to ten years required by external treatment. The bone transplant rigidly, securely and definitely splints the vertebrae, and prevents further deformity by controlling the leverage action of the diseased vertebrae. Indeed, in suitable cases, the kyphosis is actually obliterated. The splint action of the graft in its attachment to the spinous processes (the posterior arms of the lever), prevents the approximation or crushing together of the bodies (the anterior arms of the lever). In the dorsal region, this is an especially important factor since respiratory action increases mobility in spite of any form of external fixation.

Calvé and Mènard have shown that tuberculous bone is never restored from the diseased parts, and that if partially destroyed vertebral bodies are held apart by external fixation, they will only come in contact again, and the crushing and kyphosis will recur, when these supports are removed. Internal fixation corrects the kyphosis and permanently separates the diseased vertebral bodies.

Considerable discussion has arisen as to the length of post-operative treatment. In the adult cases, reported in this paper, the patients were discharged from the hospital at the end of six weeks, and except in two cases, when in deference to the wishes of the attending physician, braces were temporarily applied, no external fixation was employed. We have found no reason for the use of an additional support in any of our adult cases.

On my service at The Los Angeles Children's Hospital, the post-operative routine is six months of recumbency and helio-therapy. In two cases, operated by other men, in which too short a graft was used, and the cases required reoperation, an increase in the kyphosis was noted and the convalescence protracted to eight months' recumbency.

It is now three years since I operated my first personal case. The thirty-two patients ranged in age from three years to forty-eight. The disease had existed from six months to twelve years previous to operation. The kyphoses were in all stages of prominence. The location of the disease was dorsal in twenty-one, dorso-lumbar in four, and lumbar in eight. The largest number of vertebrae involved was six. The per cent. of successful results is 96 per cent. In these cases the least gain in weight was six pounds, the greatest thirty-eight pounds. Of the total number of cases operated, seventeen were children and I am able to report

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that twelve of these patients were apparently well in the minimum time of six months after operation. In two other cases, Japanese children, I have been unable to obtain reports since their discharge from the hospital, with all active symptoms relieved. At present writing, 14 months after operation, this patient is walking and apparently cured. In one case with a paraplegia of 22 months' duration, there is as yet no relief from paralysis eight months after operation. One case of paraplegia cleared up two months after operation and one year later is free from symptoms. There has been no mortality incident to the operation. One little patient died of miliary tuberculosis four months after operation. Another patient died on the fifth day; the pathologist reporting a stenosis of the duodenum and bile duct, with acute gastric dilatation. In none of these cases was there the slightest evidence of post-operative shock. One case operated ten months ago with dorsal disease, in which a secondary infection occurred from a sinus adjacent to the operative field, and in which a portion of the graft sequestrated, is now entirely free from symptoms. At the same time, the transplant, which was a curved graft, was broken, and yet union occurred even in the presence of infection. It is in children that the post-operative treatment should be more protracted, and patients should be kept under constant observation and control. At the Children's Hospital, we find heliotherapy an invaluable adjunct to operative treatment. Six of the cases had been long and faithfully treated by conservative orthopedic measures for periods ranging from two to six years. As to the technic in children, it is not necessary to split the shafts of the spinous processes, which indeed in several of the cases was impossible, because of their extreme thinness. The tips may be split, and the periosteum stripped off the shaft, and the transplant firmly sutured as Ryerson has suggested. I believe it is because of the small size of the spinous porcesses in children that union is slower and less certain than in adults and that, therefore, recumbency for a greater length of time is essential.

In fifteen adult cases there has been no mortality due to operation. One patient, a desperate case, with extensive pulmonary involvement died six months later of a general tuberculosis. Two cases have been lost sight of, one of which was operated at the Los Angeles County Hospital before the Southern California Medical Society in December, 1914. Both patients were discharged from the hospital as cured. In the adult cases, the results have been particularly gratifying. In five cases with psoas abscesses, four have absorbed, and in the fifth case, operated one year ago with two psoas abscesses, there has been a gain in weight of thirty-eight pounds, a disappearance of one abscess,—a small mass the size of a walnut is all that remains of the other. The same patient, a young woman of thirty-four, is spending eight hours a day over a typewriter and when examined one week ago, gleefully announced that she had been dancing all winter. This same patient was paraplegic for three months in 1907 and treated with plaster and brace fixation for four years.

The early relief from pain and the sense of security, are quite noteworthy, and have been in my experience constant features. These adult cases are particularly attractive and I can think of no disadvantages that can be attributed to the operation. On the other hand, it is certainly a decided advantage, as Rugh points out, where, in the case of a wage earner such an operation "makes him again an independent instead of a dependent member of the community in at most a year's time." If no other argument were presented to justify operation in a case, this one alone would be sufficient.

Disadvantages commonly attributed to the operation are suppuration, loss of the graft, and increase of deformity. These disadvantages, I believe are the result of faulty technic. We can not always escape infection. The infection occurring, in my experience, has had no bearing on the final result of the operation. Any increase in deformity is due to too short a graft, which is entirely a matter of technic, or from an extension of the disease to the vertebrae beyond the graft.

Avoiding errors in technic the results in these operations will, I believe, favorably compare with those obtained under any other form of treatment of vertebral tuberculosis as yet devised.

THE PHYSICIAN'S RESPONSIBILITY TO LIFE INSURANCE.

By PHILIP KING BROWN, M. D., San Francisco.

Since the various aspects of a social insurance program are being thoroughly investigated in California and one of these aspects concerns the important relation of physicians to the movement, it seems fitting to present to the medical profession some light on the relation in which physicians now stand to insurance. Valuable as is the protection of any sort of insurance, and universal as should its application be, it is no stronger a protective factor than is its weakest part. Its funds must be economically and safely administered, its resources wisely invested, its business methods above criticism and the medical examinations of its clientele kept up to a high standard. The history of life insurance is marked by a large chapter of mismanagement, misappropriation and bad selection of risks. Regulation by law has been necessary to correct many of the conditions, with the result that a large number of the companies have had to go out of business. Those that remain in the field, either because they were well and honestly handled in the beginning, or because they are forced into recognized standards of administration by legislative regulation and commission supervision, are as a rule enormously prosperous organizations, able to purchase whatever they need for the successful administration of their business. The medical examination of their so-called applicants is one of the commodities that they have purchased in too many cases at a rate and of a kind that does not afford them the protection in a full knowledge of the risk they assume, that they have been obliged to provide in the business part of their affairs. Through the